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THE HUMAN SCALE IN SCHOOLS

✦ SCHOOL SIZE AND AMERICA'S FUTURE

✦ BIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF
LARGE SCHOOL POPULATIONS

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SCHOOL SIZE AND AMERICA'S FUTURE

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Is the rising tide of drug abuse, alienation, sexual deviation and mob psychology among American youth connected with the massing of youth in large schools? There is evidence that this is the case.

In 1968 a panel of biologists, sociologists and population specialists from over the world met to report new findings on the effects of crowding, at the annual meeting of the American Association for the Advancement of Science. They reported conclusive evidence that crowded animal populations deteriorate biologically and psychologically, and that each generation is more harmed than the past that is subject to such crowding. The offspring of rats, rabbits, and many other animals grouped in numbers similar to those in our large schools were impaired at birth and each generation of animals so affected was more harmed by such crowding than were their parents.

An article in Scientific American in 1962 relates that rats "were permitted to increase to approximately twice the number that experience had indicated could occupy the available space with only moderate stress from social interaction. The consequences of pathology were most apparent among the females. Among males, the behavioral disturbances ranged from sexual deviation to cannibalism, and from frenetic over-activity to withdrawal." Short of physical cannibalism, the same kind of responses are observable among humans under similar circumstances; the effects of crowding on lower animals is fundamentally similar to the effects on human beings, as demonstrated in modification in the adrenal glands in consequence of stress.

Crude statistical evidence from Selective Service 1966 figures of failure to meet mental requirements of the armed services show that of the nine states of the northern part of the United States and California with largest cities and school systems the rate of failure to meet mental requirements was two and a half times the failure rate of the ten northern states with smaller cities and smaller rural schools. Despite poorer educational resources and much less wealth such states as New Hampshire, Vermont, the Dakotas and Iowa have a far lower rate of failure.

A special meeting was held recently for principals of large high schools in Washington D. C., and it was

agreed by those attending that "good education can be destroyed by making a high school too big."

According to report, "One principal called his 4,000 student high school a 'monstrosity' and said that the more students he gets, the greater the problems.

"'There is something about largeness that attracts more problems,' said another principal, 'yet we continue to build larger and larger high schools.'"

The drive to have American youth bussed to larger and larger consolidated schools--against the will of the people--has been proceeding now for several generations. In 1955 the Ohio State Department of Education was planning a new wave of super-consolidation, and it now seeks legislation to carry it out. The growing evidence of harm from such massing of human beings has been widely noticed only during the past decade, and the avalanche of evidence of its effect on youth has become devastatingly evident only within the past five years. Thus the education departments are still driven by policies that were formed long ago, and that are out of harmony with reality.

The American public cannot wait for this new evidence of damage to youth from large schools to trickle through to educational administrators. It takes several generations for new ideas and evidence to make its ways into the counsels of the state--as is dramatically evident of the problem of pollution. Charles Kettering, when director of Research for General Motors, observed that in technology it commonly took twenty years for new developments in technology to reach the teaching in the universities, and then another period of time before university graduates to get on the job and in positions of influence. Under the present circumstances this kind of time lag in reversing the tide of school consolidation is having a disastrous effect on the pattern of school development. School districts now seeking to "de-consolidate" to correct the effects of over-consolidation, are having to relinquish much investment in structures and systems, and are facing the severe resistance of administrative bureaucracies.

More than two thousand years ago Aristotle pointed out that democracy requires small communities in which people can know each other. A healthy society requires social control within groups or communities small enough so that people can know each other well. For each species of animal, biologists have found that if groups are enlarged beyond a certain limit social order breaks down. Among human beings this has always been true. Carl Zimmerman, a Harvard sociologist, studied the characteristics

of families that had so far survived large city living without disaster, and found that successful grouping of about five families with common values was the essential condition for success. The larger the city the more extensive has been crime and social breakdown. What is happening in the streets of Washington and New York has happened in large cities throughout history. And the same is true of large schools. Studies have shown that the larger the school the fewer are the friends that students have, and the less the personal contact between generations--in other words, the generation gap is directly caused (though not caused only) by the large school. If the delicate structure of personal relationships in society is thus broken down, there remains only the police power and the mob and its psychology to control individual members. And the mob is proverbially blind, proverbially violent, proverbially out of control, and police power is progressively estranged from the people.

Our departments of education respond to this criticism of their continuing drive toward larger schools by saying that the movement of technology and specialization in a new age requires it. They assert that the small high school of from eighty to a few hundred students cannot give the complex curriculum and staff required in an age of space technology. These administrators are themselves out of touch with the advances of technology. They have not paid attention to the best thinking of their own profession--as exemplified, for example, by the last yearbook of the Department of Rural Education of the National Education Association entitled The Community School and the Intermediate Unit. This study shows that modern technology makes it possible to take a diverse and rich curriculum and an adequate faculty to youth in smaller schools and school districts, and for youth from smaller schools to benefit from attending specialized schools serving a number of school districts. Such procedures of maintaining the small school and school district as part of a new educational pattern has been successfully developed by some of the more progressive state education systems, as in the Western States Small School Project. For urban industrial society Urie Bronfenbrenner's Two Worlds of Childhood, a study of the complementary values in Russian and American schools, is relevant to this issue. Soviet Russia's education system proves that it is possible to redevelop community relationships between age groups in an industrial civilization.

Educational administrators have sometimes responded to such evidence and argument by saying "yes, we are aware of such issues, and deplore the large schools. But we are only seeking to eliminate schools too small to give an effective education." Their idea of what is large

and what is small is indicated by the standard they seek to enforce, commonly a minimum of five hundred students in a highschool and three hundred in an elementary school. It is necessary to be precise with regard to the size of student body that is progressively harmful as it grows larger. Our evidence from lower animals and from data on school populations shows that in terms of nervous stress and other harmful influences of crowding, five hundred students in a high school is a large and not a small school. From the standpoint of social and psychological health student bodies of seventy to two hundred per high school are much to be preferred to schools three and four times as large.

The relationship of the school to the community of adults from which children come is also very important. The educational administrators commonly assume that any population with its children collectively brought to attend a school can be called, or can constitute, a community. One could as well say that a hundred and forty pounds of human flesh put in a bag can be called a person. Communities depend, as we have noted, on a size small enough for people to know and interact with each other. And they require a history of association and common management of their affairs. It is impossible to have a community merely by the fact that people in a geographic area vote for a school board.

It is not wise for a democracy to leave widely ramifying public issues to the decision of narrow specialists. Specialists, as the saying goes, "know more and more about less and less." Specialists in educational administration are generally ignorant of the issues beyond consideration of school finance and curriculum formation. That drug abuse, sexual licence, mob psychology, mental problems, personal irresponsibility and alienation between age groups result from the massing of youth in institutions out of the community is not in the area of attention of most educational administrators. But it is in the area of concern of the American public. The public needs to be informed, to act, and by its democratic responsibility to bring about necessary changes in the pattern of educational administration so drastically affecting the future of our society.

THE BIOLOGICAL AND PSYCHOLOGICAL EFFECTS OF LARGE SCHOOL POPULATIONS

Some time ago Dr. Dan Dodson of New York University was the featured speaker at a meeting of a mental health association near Dayton, Ohio. He told of the mental health stresses of large schools and of Ruth Katinsky's report of a careful experimental endeavor to improve mental health in a large New England school. For the period of a year the school was given all that modern knowledge and specialized services can provide to correct the mental health problems, and at the end of the year an evaluation was made of the effect of this program. The only observed net effect of the year's work was an increase in anxiety. On the basis of what we are now learning about the effect of crowding large numbers of animals in a limited area, we might anticipate such an outcome. It is the ignorance of this effect that has led educational administrators to assume that the larger the school, the more effective it could be and the more able to afford psychological services to correct psychological problems. Until recently it had not begun to dawn on people that the large school creates mental and physical health problems that specialized health services cannot correct.

For some time ecologists have been gathering information on the effects of crowding on lower animals similar to that in our modern school systems on children and teachers.

The findings are that animals not bred to be unresponsive to stimuli from high concentrations of the species are disastrously affected by crowding. Each species of wild animal needs an appropriate area in which to live without excessive intrusion into it by others. The greater the departure above or below the optimum concentration and size of group, the greater the impairment of capacity for healthy reproduction. And the impairment that has been particularly found is not caused by limitations of food, sanitation and other physical factors of the environment, but by the proximity and size of group of the animals themselves. Susceptibility to disease, mental and emotional breakdown in health and impairment of parenthood all increase as the group grows beyond the optimum size. So similar are those effects of crowding on lower animals to the effects on human beings that Kurt Richter and his group of researchers at Johns Hopkins' psychobiological laboratory called in a physical anthropologist to participate in their study of crowding among rats. These effects of crowding have been the subject of lead articles in Scientific

American, Science and the Bulletin of Atomic Scientists.
Bizarre sexual conduct and the variety of psychoses among human beings had their analogue in the deterioration of the animals under study.

At Community Service Arthur E. Morgan has tried to find if any human population in history or in the world has adapted to crowding so as to be able to continue for many generations under such conditions. The only such population that has been found is one that rigorously avoided its surrounding urbanizing and schooling influences. Human populations thus appear to respond to crowded living in the same way as lower animals, for it has been found that rats, for example, progressively lose their capacity to survive after some generations of living under crowded conditions--even to the point that later generations cannot survive even when free from crowding.

The effect of crowding has been determined as stemming from overstimulation and stress. Hans Selye is the leading investigator of stress, and he has shown that stress is an underlying cause of much disease and physical degeneration. Crowding in our schools may be, thus, much more serious in its effect on health than the unsanitary conditions that our health departments are so careful to have our schools avoid.

Many people assume that large institutions and aggregations of students and urban dwellers are the inevitable direction of development of civilization. When these serious effects of crowding are pointed out, the usual response is that modern technology will enable people to avoid their harmful effects. Some time ago a biologist reported an experiment in countering the deterioration of crowded rat populations by giving the rats tranquilizing drugs so that they would be less responsive to the stimulation and stress of crowding. He said that when tranquilized, the rats could live and reproduce as they could not when fully alert and more sensitive. Ben Katon, a master farmer, tells of his experience with fine brahmin cattle that were too high strung and spirited to get along in the barnyard, but that when he gave them tranquilizers, they became docile and tractable. It is the process called "homeostasis" that leads animals instinctively to correct for an abnormal environmental condition, and one means people tend to use to compensate for the effect of crowding is to employ such common forms of tranquilization as tobacco. An editorial in the AMA Journal pointed out that tobacco is one of the least dangerous forms of tranquilization.

Just as cattle can be made docile and tractable and less live, so do the tranquilizing drugs reduce the sensitivity of people to ambition, conscience and stimuli. Tranquilized people are more readily subject to enslavement, exploitation and domination by rulers. Yet without

tranquilization the overstimulation of crowded living leads to uncontrolled overactivity and eventually to exhaustion. Such chronic overstimulation is clearly apparent in the students who come to college from large cities as contrasted with those from rural areas. The resort to tranquilization is much more widespread among city youth. The use of marijuana, LSD and heroin has spread to become fairly general in the country's city and large rural schools. Enforcement of drug prohibition has largely failed. The causes have been given too little consideration. Since drugs are a means of "turning off" stress and pressure from the large school environment, we may say that the large school system bears an important responsibility for the drug problem. It is the smaller rural schools that have remained relatively free from this dangerous trend. It would therefore appear to be folly to force the smaller schools to close and to have their children crowded, bussed into large school systems far removed from the stabilizing influence of the local community.

One of the ablest studies of the devitalizing effects of school crowding was made by the late Dr. William R. P. Emerson, when professor of Pediatrics at Tufts Medical College. By means of careful quantitative analysis of influences on health, Dr. Emerson found that a primary cause of the impairment of health of students was nervous exhaustion. He found that this impairment tended to increase as long as students were in the usual school stress environment. By a health program including avoidance of nervous exhaustion through a regimen of adequate rest before meals and avoidance of excessive nervous stress--particularly at meal times--Dr. Emerson was able to reduce the sickness and death rate of Aetna Life Insurance employees and of Dartmouth College students by forty-five percent. But these were spartan measures.

Dr. Emerson found that one of the most important effects of nervous stress in school was its influence on the nutrition of students, particularly through the noisy, rushed and keyed-up conditions under which children ate their lunches. Nutrition and assimilation of food did not take place well under such circumstances.

All creative physiological processes, (particularly nutrition, pregnancy, nursing and maturation) require psychic or nervous energy. The crowded group is characteristically a drain of psychic energy, leading to its depletion. Yet childhood is the time when psychic energy is most needed for the biological and psychological functions required for emergence into healthy adulthood. In placing children in crowded environments we are creating circumstances that impair the basic processes of developing into stable competent adult personalities. The organism

instinctively resists such drains on psychic energies and subconsciously seeks to avoid them through dislike for school and school work and with desire for the drugs that will tend to insulate the nervous system from stimuli and conscientious drive to do what the school administration desires of the student. This creates a poor environment for learning, poor motivation, poor morale, poor self-discipline and a desire to escape from a harmful environment.

Those children whose homes are strong havens of peace and order are to a degree protected from this stress. But variations in susceptibility to stress are very great. The more sensitive and creative people tend to be most harmed by large numbers. Thus in creating large institutions for many students a procrustean bed is created in which a significant number of students would be particularly harmed. Among lower animals the variations in susceptibility to overstimulation from crowding have been found to vary dramatically between domesticated and wild animals and is not something that a strain of animals can adapt to without breeding out those that are most sensitive. Thus phlegmatic domesticated white rats are much less harmed by crowding than wild rats. The Pennsylvania Game Commission found a similar contrast between wild and domesticated game, such as turkeys, and that the wild strain turkeys, though superior animals, had a far higher death rate under barnyard conditions because of their much higher alertness, sensitivity and responsiveness to stimuli.

It should be clear that there is no such thing as healthy acclimation to such effects of crowding, any more than there is an acclimatization to atomic radiation from exposure to it. Brief periods of radiation or of crowding may be unharmed if, on balance, there is a relative freedom from it. Seals, birds and buffalo all had their times of herd crowding, but these were balanced by long periods of isolation.

The World Health Organization made a survey of residential institutional needs of small children and found that the younger children were particularly harmed by being in large institutions. We can say with confidence that the smaller the child the smaller the institution he should be in. In its ultimate, we can see that the human fetus should not share the womb with half a dozen others, and it is a rare family in which the child is unharmed from sharing the family with two dozen other young children.

The United States Department of Health, Education and Welfare financed a study of the effect of school size entitled Big School--Small School, made by the Kansas Midwest Psychological Field Station. According to this report, "without participation, education cannot occur, however excellent the facilities may be. All our findings reveal

a negative correlation between school size and individual student participation. To the degree that this is true it means that when better facilities are purchased at the expense of larger size, they are discounted by lower participation of students." Specifically, this means that as the number of students increased beyond a hundred per school, a major factor in learning was progressively impaired.

Still another study was made of personal friendships and relationships between students and between students and teachers--in the state of Washington. It was found that the larger the institution the less the friendship and association. Since development of a circle of friends and of a personal relationship with teachers is crucial to good personality development, this is another indication of the harm that is being done by America's fad of building large mass production education facilities. For the falling off of friendship is a measure of alienation, which is a cause--both of mental ill health and of poor scholarship and citizenship.

We have growing reason to believe that there are areas of life and reality that are not taken into consideration by the prevailing dogmas of science. Dr. Edward U. Condon, once head of the United States Bureau of Standards, said "the physics of the year two thousand will be as strange and unforeseeable by us today as the physics of today would have seemed to the physicist of nineteen hundred." The same may be far more true in the life sciences, as some biologists have pointed out.

Dr. H. S. Burr, when professor of neurophysiology at Yale University Medical School, pioneered in the study of electromagnetic fields in life processes. For example, with electronic instruments he was able to determine the relative size two grains of corn would attain when they developed into full plant growth.-- Dr. Burr asserted that from his investigations, he had come to the conclusion that in their electromagnetic fields, living things interpenetrated each other, and that biological fields are among the controls over life processes. It is entirely conceivable to a person experienced with such field phenomena in nature that an excessive concentration of field influences of living things could be as harmful as excessive concentration of body heat in an area because of overcrowding. Cleve Backster's use of the polygraph to measure stimuli between animals and plants suggests that we are dealing with an area not now understood. These stimuli could not be eliminated even by electromagnetic shielding. Whether overstimulation from overcrowding takes place through physical principles and influences we have yet to discover or through those we already know, remains to be determined. But certainly overstimulation does exist, and

we do not yet know how it works. There are no sound grounds for assuming that we can overcome and compensate for harmful effects of overcrowding (as by breaking large classes into small rooming units) when we are in ignorance of how these effects take place. The number and frequency of personal interactions is not the primary cause of the harmful effect of crowding. Many a villager has far more social interaction than the average urbanite; yet, it is the urbanite that suffers stress from overstimulation from his environment. Among grasshoppers, a fairly wide scattering of insects over an acre can yet be too dense and cause overstimulation.

Thus we cannot assume that we will be able to avoid severe and deepseated damage from the typical massing of children in schools. It once seemed obvious to industrialists that there would be greater effectiveness and efficiency in having all of a large firm's operations under one series of roofs in a large factory compound. But the experience in industry has been against this conclusion. The Morris Bean Foundry was divided into two smaller plants in neighboring Cedarville and Yellow Springs, Ohio, partly as an outcome of a deliberate study of what is the optimum size in an industrial plant from the standpoint of morale and efficiency of the group. The education profession as such has not yet awakened to such realities, even though such studies as that of the Kansas Big School--Small School research have been available for a few years.

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